

CLAIMS

We claim:

1. A computer-implemented method for searching through ink characters within an electronic document comprising the steps of:
 - 10 (a) accepting a search query;
 - (b) retrieving a search query character from a search query word in the search query;
 - (c) accepting an ink word from the electronic document;
 - (d) accepting an ink alternate word, wherein the ink alternate word is an estimation of the ink word;
 - 15 (e) retrieving an ink alternate character for the ink alternate word;
 - (f) determining if the ink alternate character matches the search query character; and
 - (g) repeating steps d-f for a plurality of ink alternate characters.
- 20 2. The computer implemented method of Claim 1 further comprising the steps of:
 - accepting another ink alternate character for the ink alternate word in response to a positive determination that the ink alternate character matches the
 - 25 search query character;
 - accepting another search query character from the search query word;
 - determining if the other ink alternate character matches the other search query character;
 - determining if the other search query character is the last character in
 - 30 the search query word in response to a positive determination that the other ink alternate character matches the other search query character; and

5 sending a match to the match list in response to a positive
determination that the other search query character is the last character in the search
query word.

10 3. The computer-implemented method of Claim 1 further
comprising the steps of:
 determining if the search query contains another search query word;
 retrieving a search query character of the other search query word in
 response to a positive determination that the search query contains the other search
 query word; and
15 determining if the search query character of the other search query
word matches the ink alternate character of the ink alternate word.

20 4. The computer-implemented method of Claim 1 further
comprising the steps of:
 (a) accepting another ink alternate word in response to a
 determination that the ink alternate character does not match the search query
 character;
 (b) retrieving an ink alternate character for the other ink alternate
 word;
25 (c) determining if the ink alternate character for the other ink alternate
word matches the search query character; and
 (d) repeating steps a-c for a plurality of ink alternate words.

30 5. A computer-readable medium having computer-executable
instructions for performing the steps recited in Claim 1.

✓

5 6. A computer-implemented method for searching within an
electronic document comprising the steps of:
 accepting a search query comprising a search query word to be sought
 in the electronic document;
 determining if the search query word matches at least one set of
10 characters in the electronic document;
 adding a match to a match list in response to a positive determination
 that the search query word matches the set of characters in the electronic document;
 and
 displaying at least one match from the match list by highlighting the
15 set of characters in the electronic document that correspond to the match of the search
 query.

 7. The computer-implemented method of Claim 6 further
 comprising the steps of:
20 (a) retrieving document content from the electronic document;
 (b) accepting at least one document content character from the
 document content;
 (c) determining if additional document content exists in the electronic
 document; and
25 (d) repeating steps a-c for the additional document content.

 8. The computer-implemented method of Claim 6, wherein the
search query comprises at least two search query words, further comprising the step
of processing a boolean operator in the search query.
30

5 9. The computer-implemented method of Claim 8, wherein the
step of processing a boolean operator in the search query comprises:
 accepting the boolean operator from the search query;
 accepting a match to a first query word before the boolean operator
from the match list;
10 accepting a match to a first query word after the boolean operator from
the match list;
 determining if the match to the first query word before the boolean
operator and the match to the first query word after the boolean operator satisfy a
spatial relationship; and
15 removing from the match list the match to the first query word before
the boolean operator and the match to the first query word after the boolean operator
in response to a failure to satisfy the spatial relationship.

20 10. The computer-implemented method of Claim 9, wherein the
spatial relationship is satisfied if the match to the first query word before the boolean
operator and the match to the first query word after the boolean operator occur within
the same paragraph of the electronic document.

25 11. The computer-implemented method of Claim 9, wherein the
spatial relationship is satisfied if the match to the first query word before the boolean
operator and the match to the first query word after the boolean operator occur within
the same page of the electronic document.

5 12. The computer-implemented method of Claim 6, wherein the
step of displaying the matches further comprises:
 sorting the matches in the match list;
 identifying the match in the match list that is closest to a match point
in the electronic document;
10 navigating through the electronic document to the match closest to the
match point; and
 selecting the match closest to the match point.

 13. The computer-implemented method of Claim 12, wherein the
15 match point comprises the cursor location in the electronic document.

 14. The computer-implemented method of Claim 12, wherein
sorting the matches comprises sorting the matches in the match list by the page
number in which the match is located in the electronic document.

20 15. The computer-implemented method of Claim 6 further
comprising the steps of:
 (a) sorting a plurality of matches in the match list by page number in
the electronic document;
25 (b) accepting a first match and a second match from the match list;
 (c) determining if at least one character is between the document
content characters corresponding to the first match and the second match in the
electronic document;
 (d) merging the first match and the second match in the match list in
30 response to a negative determination of at least one character between the document
content characters corresponding to the first match and the second match
 (e) retrieving a next match in the match list; and
 (f) repeating steps b-e for the plurality of matches in the match list.

5 16. The computer-implemented method of Claim 6, wherein the
step of determining if the search query word matches at least one set of characters in
the electronic document comprises:
 accepting one of the search query words from the search query;
 retrieving one of a plurality of search query characters from the search
10 query word;
 accepting a document content character from the electronic document;
 determining if the document content character is an ink character or a
text character;
 conducting a text character match in response to a determination that
15 the document content character is a text character; and
 conducting an ink character match in response to a determination that
the first document content character is an ink character.

 17. The computer-implemented method of Claim 16, wherein the
20 step of conducting a text character match comprises:
 comparing the document content character to the search query
character to determine if the characters match;
 determining if the search query word contains additional characters in
response to a positive determination that the search query character matches the
25 document content character;
 retrieving another one of the search query characters in response to a
positive determination that the search query word contains additional characters; and
 sending a match to the match list in response to a negative
determination that the search query word contains additional characters.

30

5 18. The computer-implemented method of Claim 17 further
comprising the steps of:
 determining if electronic document comprises a next document content
character in response to a negative determination that the search query character
matches the document content character;
10 retrieving the next document content character in response to a
positive determination that the electronic document comprises the next document
content character; and
 comparing the search query character to the next document content
character to determine if the characters match.

15 19. The computer implemented method of Claim 18 further
comprising the steps of:
 determining if the search query contains another search query word;
 retrieving a search query character of the other search query word in
20 response to a positive determination that the search query contains the other search
query word; and
 comparing the document content character to the search query
character of the other search query word to determine if the characters match.

5 20. The computer-implemented method of Claim 16, wherein the
step of conducting an ink character match comprises:
 (a) accepting an ink alternate word, wherein the ink alternate word is
an estimation of the actual ink word received by the electronic document;
 (b) retrieving an ink alternate character for the ink alternate word;
10 (c) determining if the ink alternate character matches the search query
character;
 (d) accepting another ink alternate word in response to a
determination that the ink alternate character does not match the search query
character; and
15 (e) repeating steps b-d for the other ink alternate word.

 21. The computer implemented method of Claim 20 further
comprising the steps of:
 accepting another ink alternate character for the ink alternate word;
20 accepting another search query character from the search query word;
 determining if the other ink alternate character matches the other
search query character;
 determining if the other search query character is the last character in
the search query word in response to a positive determination that the other ink
25 alternate character matches the other search query character; and
 sending a match to the match list in response to a positive
determination that the other search query character is the last character in the search
query word.

5 22. The computer-implemented method of Claim 20 further
comprising the steps of:
 determining if the search query contains another search query word;
 retrieving a search query character of the other search query word in
 response to a positive determination that the search query contains the other search
10 query word;
 determining if the search query character of the other search query
 word matches the ink alternate character of the ink alternate word.

 23. The computer-implemented method of Claim 16 further
15 comprising the steps of:
 determining if the electronic document comprises additional document
 content characters;
 retrieving a next document content character in response to a positive
 determination that the electronic document comprises additional document content
20 characters; and
 determining if the next document content character is an ink character
 or a text character.

 24. A computer-readable medium having computer-executable
25 instructions for performing the steps recited in Claim 6.

5 25. A computer-readable medium having computer-executable
instructions for searching within an electronic document comprising the steps of:
 accepting a search query comprising a search query word to be sought
 in the electronic document;
 determining if the search query word matches at least one set of
10 characters in the electronic document;
 adding a match to a match list in response to a positive determination
 that the search query word matches the set of characters in the electronic document;
 sorting a plurality of matches in the match list;
 identifying a match in the match list that is closest to a match point in
15 the electronic document;
 navigating through the electronic document to the match closest to the
 match point; and
 highlighting the match closest to the match point.

20 26. The computer-readable medium having computer-readable
instructions of Claim 25, wherein the match point comprises the cursor location in the
electronic document.

25 27. The computer-readable medium having computer-readable
instructions of Claim 25, wherein sorting the matches comprises sorting the matches
in the match list by the page number in which the match is located in the electronic
document.

30 28. The computer-readable medium having computer-readable
instructions of Claim 25, wherein the search query comprises at least two search
query words, further comprising the step of processing a boolean operator in the
search query.

- 5 29. The computer-readable medium having computer-readable instructions of Claim 25, wherein the step of processing a boolean operator in the search query comprises:
- accepting the boolean operator from the search query;
 - accepting a match to a first query word before the boolean operator
 - 10 from the match list;
 - accepting a match to a first query word after the boolean operator from the match list;
 - determining if the match to the first query word before the boolean operator and the match to the first query word after the boolean operator satisfy a
 - 15 spatial relationship; and
 - removing from the match list the match to the first query word before the boolean operator and the match to the first query word after the boolean operator in response to a failure to satisfy the spatial relationship.
- 20 30. The computer-readable medium having computer-readable instructions of Claim 25, wherein the step of determining if the search query word matches at least one set of characters in the electronic document comprises:
- accepting one of the search query words from the search query;
 - retrieving one of a plurality of search query characters from the search
 - 25 query word;
 - accepting a document content character from the electronic document;
 - determining if the document content character is an ink character or a text character;
 - conducting a text character match in response to a determination that
 - 30 the document content character is a text character; and
 - conducting an ink character match in response to a determination that the first document content character is an ink character.